IOS-5.2 Maintaining ICRH coupling in expected ITER regime

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| --- | --- | --- | --- |
| **TG priority:** High | **Start date:** 2010 | **Status:**  Closing | **Personnel exchange:**  Yes |
| **IO priority:**   | **End date:** 2015 | **Motivation:** Physics Basis |

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| --- | --- | --- | --- |
| **Device** | **Contact** | **TGRequest** | **Activity** |
| **2012** | **2013** | **2014** | **2015** |
| JET  | P. Jacquet | Desirable | Committed | Committed | Committed | Committed |
| AUG  | V. Bobkov | Desirable | Committed | Committed | Committed | Committed |
| C-Mod  | S. Wukitch | Desirable | Committed | Analysis | Analysis | Analysis |
| DIII-D  | R. Pinsker | Desirable | Considering | Not doing | Not doing | Done |
| NSTX-U  | J. Hosea | Desirable | Analysis | Analysis | Analysis |   |
| Tore Supra  | M. GonicheL. Colas | Desirable | Considering | Done | Done |   |
| KSTAR  | S. J. Wang | Desirable | Considering | Considering | Considering |   |
| JT-60U  | S. Moriyama | Desirable | Analysis | Analysis | Analysis | Analysis |

**Purpose**

For effective and reliable operation of ICRF system in ITER, good coupling conditions should be maintained. Gas fuelling at the launcher or from a location magnetically connected to the launcher could raise the density in the SOL and increase the coupling resistance by moving the cut-off layer closer to the antenna. This technique has potentially deleterious effects on: wave propagation/absorption, confinement (pedestal height), antenna voltage stand-off (neutral pressure). Most of the devices are now equipped with gas injection systems possibly connected to the ICRH antenna.

 **Results for 2015**

* Modeling the 3-D neutral/plasma effects of the gas puffing on AUG reproduce the experimental trends well. The magnitude of the effect can be somewhat larger in experiments.
* Although the 3D modelling has not been done for ITER, the planned gas injection location at the top of the vessel should be more efficient on ITER than on JET, thanks to the good match of the magnetic field lines between the gas valve and the antennas.

**Plans for 2016**

* This joint experiment has now published most of the relevant information and will be closed.